(12) **United States Patent**
Pearce

(54) **VENTING CAP**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/277,918**

(22) Filed: **Mar. 29, 1999**

(51) **Int. Cl.**[7] **B65D 51/16**

(52) **U.S. Cl.** **215/307**; 215/310; 215/902; 215/341; 215/349; 215/343; 215/235; 215/329; 220/367.1; 220/810

(58) **Field of Search** 215/329, 902, 215/307, 349, 348, 343, 341, 344, 235, 237, 310; 220/367.1, 810, 820, 837; 222/534, 556

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(57) **ABSTRACT**

A bottle cap is provided that allows for venting of gases generated in a bottle. A single or multiple ridges are formed on the inner surface of the cap top such that the ridges sit on the bottle mouth rim when the cap is threaded onto the bottle. A single or multiple slots may be formed across each of the ridges. Alternatively, a single or multiple grooves may be formed on the inner surface of the cap top. The ridge(s) or groove(s) may also be formed on a disc fitted over the inner surface of the cap top. When the cap is threaded on to the bottle, gases generated in the bottle can escape through the slot(s) formed across the ridge(s) or through the groove (s) formed on the inner surface of the cap top. A liner having an opening formed through its thickness may be placed in the cap. The liner opening allows the passage of gases from the bottle to the slot(s) or groove(s) formed on the cap top or disc.

VENTING CAP

BACKGROUND OF THE INVENTION

This invention relates to bottle caps which when screwed on a bottle allow for the venting of gases generated in the bottle.

Shampoos, cold creams and other cosmetics are typically prepared under heat and are poured into plastic containers such as bottles usually while still hot. The plastic bottles containing the hot cosmetic material are capped, trapping the hot gases generated by the hot cosmetics. When capped, a lower or inner surface **10** of the cap top seats against the mouth **12** of the bottle **14** forming a seal (FIG. **1**). Consequently, if capped immediately after filling, the gases generated by the hot cosmetics generate a pressure within the bottle. The hot pressurized gases cause the plastic bottle to form flat spots. This condition is commonly referred to as "bottle paneling." Moreover, the increase in pressure within the bottle may cause the bottles to explode creating a hazardous condition. One way to avoid pressure build-up and paneling is to fill the bottles while the cosmetics are cold. When cold, the cosmetics are thick and viscous, thus, having reduced fluidity. Consequently, the filling process is slowed requiring a longer time to fill the bottles.

A typical way of avoiding pressure build-up and paneling is to fill the bottles with the hot cosmetics and wait for a period of time, typically in the order of 24 hours, before capping the bottles. This approach also slows down the filling process adding to production costs.

Another common way of preventing bottle paneling, incorporates a grooved liner fitted into the bottle cap. The liner typically has a surface that has grooves forming a cross-hatched pattern as well as holes penetrating its thickness. The bottom surface of the liner is covered with a gas permeable layer. When fitted into the cap, the grooved surface of the liner is mated to the lower surface of the cap top. When the cap is screwed onto the bottle, the holes provide a path for gas generated within the bottle to travel to the grooves which provide a path to the inner circumference of the cap from where the gas can escape through the space created between the cap rim and the bottle neck to the exterior of the bottle.

Thus, there is a need for a fail safe bottle cap that would allow for venting of gases generated in a bottle so as to allow for the capping of bottles immediately after being filled with hot liquids.

SUMMARY OF THE INVENTION

A bottle cap is provided which when screwed on to a bottle provides a path for gases generated in the bottle to escape from the bottle through a spiraling space formed in the threaded region between the inner surface of the bottle cap rim and the outer surface of the bottle neck.

The bottle cap includes one or a plurality of concentric preferably circular ridges formed on the inner surface of the cap top. Each of these ridges is designed to sit on the rim of the bottle mouth when the cap is threaded onto the bottle neck. A slot or multiple slots are formed in each ridge. The slots between adjacent ridges may be staggered or may be aligned.